A Field Guide for Identification and Interpretation of Seral Aspen Ecosystems of the BWBSc1, Prince George Forest Region

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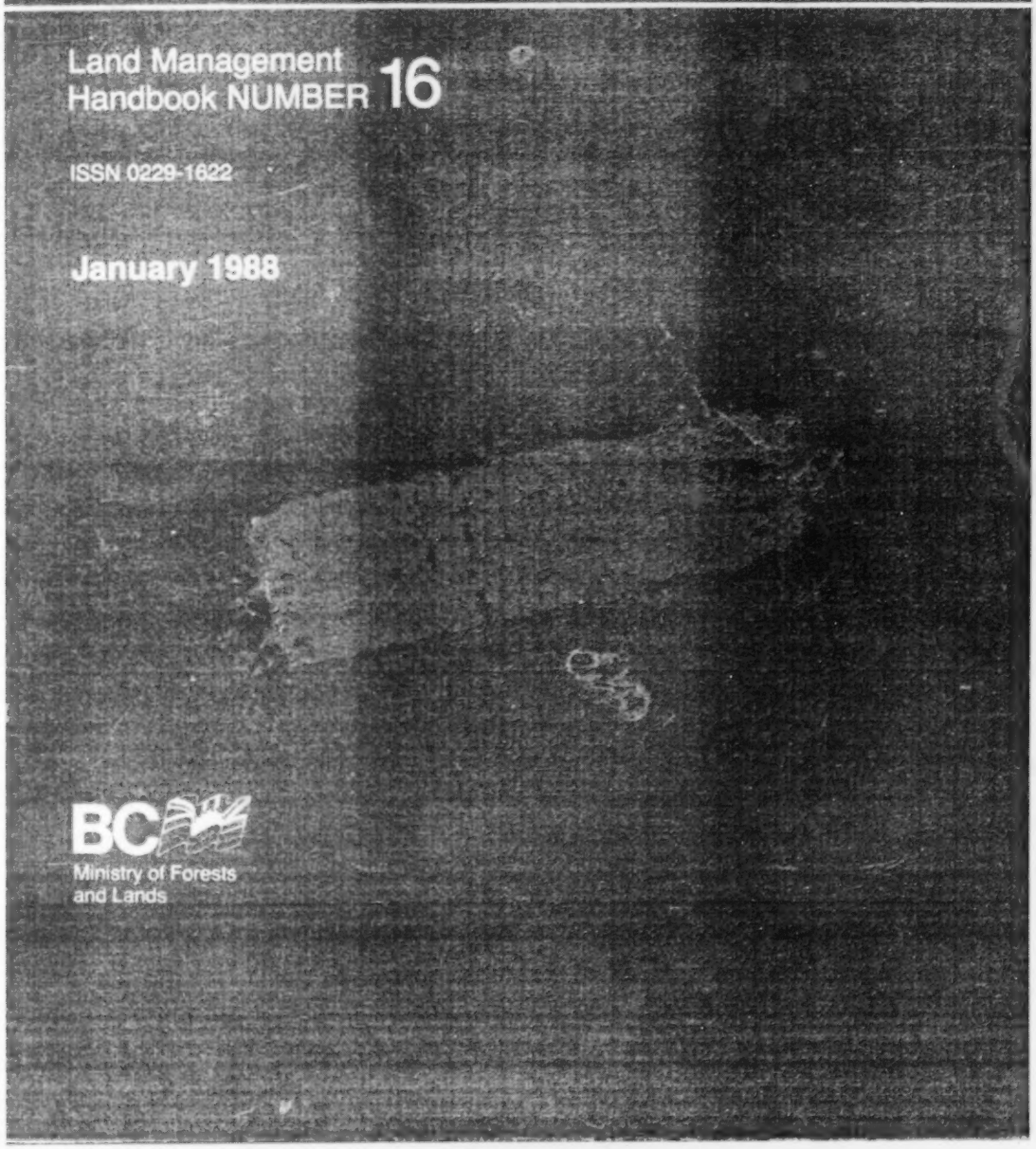

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A Field Guide For Identification and Interpretation of Seral Aspen Ecosystems of the BWBSc1, Prince George Forest Region

by
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Karen Yearsley did the data analysis for the mensuration graphs in Appendix 6.

Word processing was by Jennifer Giesbrecht. Figures were drafted by Lena MacMaster. Illustrations have been used, with permission, from Goward[1], Hale (1979), Hitchcock et al. (1977), Schofield (1968), Szcsawinski (1959, 1962), and Taylor (1966, 1973a, 1973b, 1974a, 1974b). Scientific names follow Taylor and MacBryde (1977), and common names follow Meidinger (1987).

I would also like to thank the Vegetation Section, Surveys and Resource Mapping Branch, B.C. Ministry of Environment, for the use of some data.

1 Goward, T. 1987. Unpublished illustrations. Property of the Royal B.C. Museum, Victoria, B.C.

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1 INTRODUCTION

This field guide describes the seral aspen ecosystem units of the Murray River variant (BWBSc1), of the Moist Warm Boreal White and Black Spruce zone in the Prince George Forest Region. It presents aids to the identification of these units, and management interpretations for each unit.

Users of this guide must have been trained to identify vegetation and soil and site factors. Courses in identification are provided by the Prince George Regional Ecology Section. (For details, contact the Regional Ecologist.)

The guide is divided into three sections: Section 1 is an introduction; Section 2 describes the use of the guide; and Section 3 describes the seral ecosystem units and their management interpretations.

Questions regarding the biogeoclimatic classification system in general, or the units described in this guide in particular, should be directed to: Regional Ecologist, Forest Sciences Section, B.C. Ministry of Forests and Lands, 1011 - 4th Avenue, Prince George, B.C. V2L 3H9. Telephone 565-6100.

2 USE OF THE GUIDE

2.1 Identifying Biogeoclimatic Units

Biogeoclimatic units are most easily identified from maps. Biogeoclimatic unit maps at a scale of 1:250,000 are available from the Ministry of Forests and Lands (MOFL) District Office in Dawson Creek, or from Ecology, Forest Sciences Section, MOFL, Prince George.

If an area lies near a mapped biogeoclimatic unit boundary and it is not clear which biogeoclimatic unit it belongs to, the user should compare the site units found in the area to those described for both biogeoclimatic units, and select the appropriate unit accordingly.

2.2 Identifying Site Units

Site units can be identified by a combination of soil, site and vegetation factors, which together are used to derive ecological moisture and nutrient regimes for the site. Having selected the appropriate biogeoclimatic unit (Section 2.1), the user should inspect the area under consideration to determine if there are obvious moisture or nutrient differences that have led to the development of several vegetation units on the site. If several site units appear to be present, the user should stratify the area before identifying these units. At each different site unit, the user should then record site features (2.2.1) and vegetation features (2.2.2), and use these to determine moisture and nutrient regimes (2.2.3).

2.2.1 Soils and topographical features

The most important topographic characteristics to note are: slope position (Appendix 1); slope gradient; and aspect. The most important soil characteristics to note are: soil texture (procedures for determining soil texture are given in Appendix 2); coarse fragment %; humus form and depth (procedures for determining humus form are given in Appendix 3); depth to water table; and rooting depth.

2.2.2 Vegetation features

The plant species on the site and their relative abundance should be noted. Caution must be exercised in using vegetation to classify recently disturbed sites. Plant guides such as "Some Common Plants of the Sub-Boreal Spruce Zone" (Pojar et al. 1982) or "Some Common Plants of the Skeena Region" (Coupe et al. 1982) are helpful, and may be available from Ecology, Forest Sciences Section, MOFL, Prince George.

2.2.3 Moisture and nutrient regimes

The information from soils, topography, and vegetation is used to estimate the relative amounts of moisture and nutrients available for plant growth. The guide user must keep two important factors in mind:

1. Moisture and nutrient regimes are relative within a biogeoclimatic unit. For instance, a site that is average in moisture regime in one biogeoclimatic unit may be wetter or drier than a site that is average in moisture regime in another biogeoclimatic unit.

2. All factors must be taken into account when soil moisture and nutrient regime are determined. One factor may compensate for another; for instance, a coarse-textured soil, which might be expected to be dry, might be wetter if it occurred at the base of a slope.

Moisture and nutrient regimes can be estimated using the keys in Appendices 4 and 5.

2.2.4 Identification of units

After gathering soils, topographic, and vegetation information, the user should now proceed to:

1. the edatopic grid (Figure 1) where the moisture and nutrient regime can be used to locate the site unit on the grid; or

2. the key to site units (p. 6), where dichotomous keys use the soils, topographic, and vegetation features to identify a site unit.

The edatopic grid and the key to site units will direct the user to a particular site unit, or units. Soils, topographic, and vegetation features on the site can then be compared with those summarized for the particular site unit(s) to ensure the proper site unit is identified. Soil and site features considered characteristic of a certain site unit, or particularly useful in distinguishing it from other site units, are marked with an asterisk (*).

2.3 Management Interpretations

Once the site unit has been identified, the management interpretations for that unit are available on the page adjacent to the site unit description. Interpretations are offered as guidelines to the preparation of management prescriptions; they detail the opportunities and constraints that a resource manager must consider when dealing with a particular ecosystem. It should be noted that interpretations will vary depending on what the site will be managed for, and therefore they should be used with caution.

2.4 Mensuration Data

On each ecosytem unit page, in the soil and site section, there are site indices (age 100) given for tree species that were found on sites belonging to that ecosystem unit. Additional mensuration data are given in Appendix 6.

NOTES

3 SERAL ASPEN ECOSYSTEM UNIT DESCRIPTIONS AND INTERPRETATIONS FOR THE BWBScl VARIANT

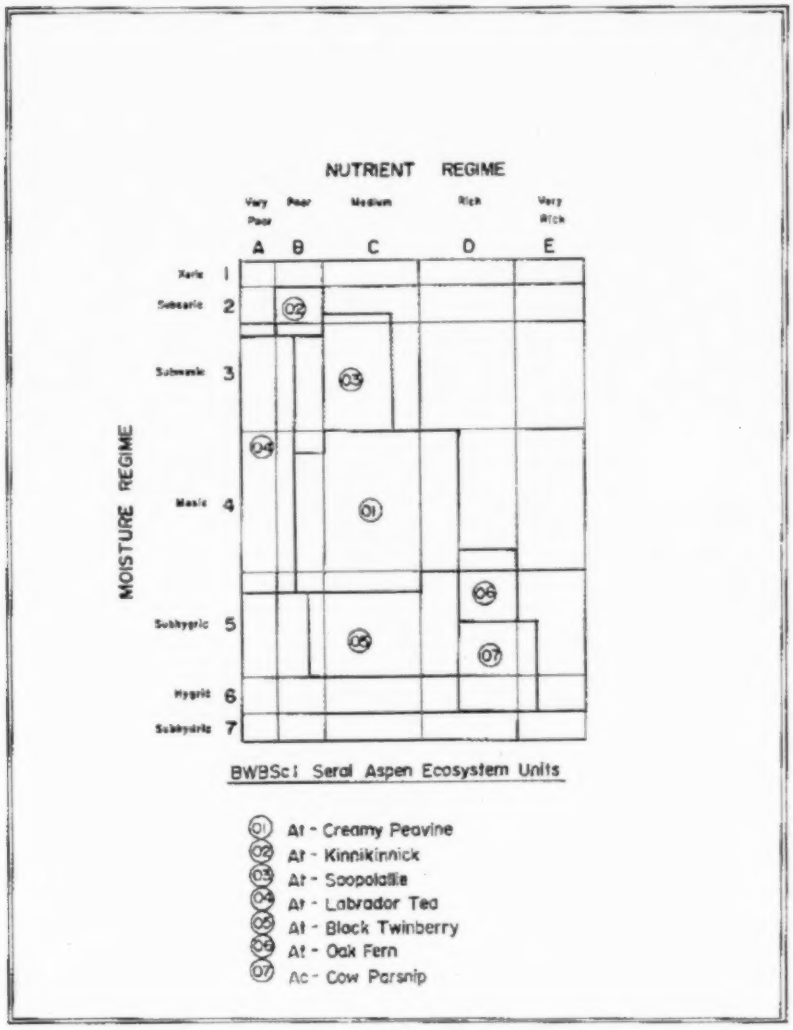


FIGURE 1. Edatopic grid for the seral ecosystem units of the BWBScl variant

KEY TO SERAL ASPEN ECOSYSTEM UNITS OF THE BWBScl

1a Canopy dominated by balsam poplar

2a Mid- to toe slope or level; seepage water often present; soils often fluvial; Heracleum sphondylium (p. 27)[1] usually present
BWBScl/07-$[2]

2b Slope position variable; seepage water absent; soils variable; Heracleum sphondylium usually absent
BWBScl/01-$

1b Canopy dominated by trembling aspen

3a Aspect usually northerly if sloping; Gymnocarpium dryopteris (p. 26) or Ledum groenlandicum (p. 9) present

4a Generally less than 5% slope; Ledum groenlandicum present, Gymnocarpium dryopteris absent
BWBScl/04-$

4b Generally greater than 5% slope; Gymnocarpium dryopteris present, Ledum groenlandicum absent
BWBScl/06-$

3b Aspect variable; Gymnocarpium dryopteris and Ledum groenlandicum absent

5a Mid-slope to crest; Elymus innovatus (fuzzy-spiked wildrye) usually present and often abundant (> 1%)

6a Coarse-textured soil at surface; Arctostaphylos uva-ursi (p. 16) low to moderate cover (> 1%)
BWBScl/02-$

6b Soil texture variable at surface; Arctostaphlos uva-ursi very low cover (< 1%) or absent
BWBScl/03-$

5b Usually mid- to toe slope or level; Elymus innovatus usually very low cover (< 1%) or absent

1 Page numbers refer to the publication "Some Common Plants of the Sub-Boreal Spruce Zone" (Pojar et al. 1982).

2 $ denotes seral ecosystem.

KEY TO SERAL ASPEN ECOSYSTEM UNITS OF THE BWBScl (continued)

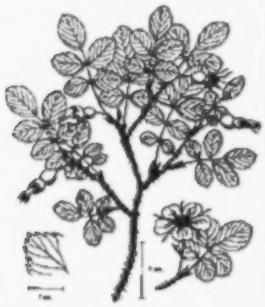
7a Seepage water often present; Heracleum sphondylium or Actaea rubra (p. 19) usually present

BWBScl/05-$

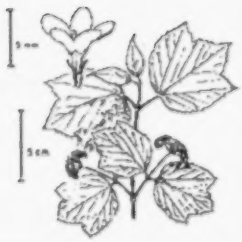
7b Seepage water absent; Heracleum sphondylium and Actaea rubra usually absent

BWBScl/01-$

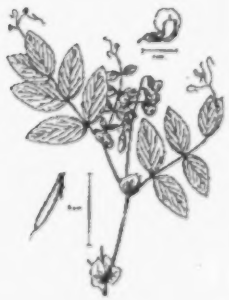
AT - CREAMY PEAVINE



Rosa acicularis



Viburnum edule



Lathyrus ochroleucus

VEGETATION

Tree Layer: 45% cover
Trembling aspen

Shrub Layer: 25% cover

Rosa acicularis	(prickly rose)
Viburnum edule	(highbush-cranberry)
Amelanchier alnifolia	(saskatoon)
Lonicera involucrata	(black twinberry)
trembling aspen	

Herb Layer: 45% cover

Lathyrus ochroleucus	(creamy peavine)
Epilobium angustifolium	(fireweed)
Cornus canadensis	(bunchberry)
Pyrola asarifolia	(pink wintergreen)
Aster conspicuus	(showy aster)
Linnaea borealis	(twinflower)
Rubus pubescens	(trailing raspberry)
Petasites palmatus	(palmate coltsfoot)
Vicia americana	(American vetch)
Fragaria virginiana	(wild strawberry)
Galium boreale	(northern bedstraw)
Calamagrostis canadensis	(bluejoint)
Maianthemum canadense	(wild lily-of-the-valley)
Mertensia paniculata	(tall bluebells)
Arnica cordifolia	(heart-leaved arnica)

Moss Layer: 5% cover
Eurhynchium pulchellum

SOIL AND SITE

Moisture Regime:	(submesic -) mesic
Nutrient Regime:	medium - rich
Slope Gradient (%):	0-60 (usually less than 20)
Slope Position:	upper - lower or level
Parent Material:	(glacio)fluvial, morainal, occ. lacustrine
Soil Texture:	fine - coarse
Coarse Fragments (%):	0-50 (usually less than 20)
Site Index:	At 24 (10-32) Ac 21 (15-27)

DISTRIBUTION: very common

AT - CREAMY PEAVINE (BWBSc1/01-$)

INTERPRETATIONS

Management objectives:	- manage for At fibre on a 60-year rotation. - conversion to Pl or Sw optional. - range conversion optional. - agricultural conversion optional.
Concerns:	- moderate to high wildlife values. - soil compaction on finer-textured soils.
Logging:	- clearcut
Site preparation (softwoods):	
Objectives	- minimize future vegetation competition; improve planter access; prepare planting spots
Mechanical	- disc-trench, disc (bedding) plow, multiple-pass breaking disc or moldboard plow
Prescribed fire	- do not burn
Species choice:	
Preferred	- At
Acceptable	- Pl, Sw
Brush hazard:	- very high (trembling aspen[3], bluejoint, fireweed)
Silviculture applications:	- site preparation not required if managing for aspen. - attempts should be made to enhance native range but the effects of burning to achieve this needs to be examined.
Silviculture problems:	- if conversion to Pl or Sw is attempted, high competition from aspen and bluejoint grass can be expected; inspection of these sites at time periods 1 and 4 years after planting will be required. - these inspections may indicate the need for single or repeated brushing and weeding to retard vegetation competition. - herbicide use may conflict with wildlife values.

[3]Only a brush problem if softwood conversion is being considered.

BWBSdl 02-$

AT - KINNIKINNICK

Rosa acicularis

Shepherdia canadensis

Arctostaphylos uva-ursi

VEGETATION

Tree Layer: 50% cover
Tremoling aspen

Shrub Layer: 20% cover

Rosa acicularis	(prickly rose)
Salix spp.	(willows)
Shepherdia canadensis	(scopolallie)
Viburnum edule	(highbush-cranberry)
Spiraea betulifolia	(birch-leaved spirea)
Amelanchier alnifolia	(saskatoon)
trembling aspen	

Herb Layer: 40% cover

Arctostaphylos uva-ursi	(kinnikinnick)
Epilobium angustifolium	(fireweed)
Lathyrus ochroleucus	(creamy peavine)
Elymus innovatus	(fuzzy-spiked wildrye)
Linnaea borealis	(twinflower)
Aster ciliolatus	(fringed aster)
Vicia americana	(American vetch)
Calamagrostis canadensis	(bluejoint)
Fragaria virginiana	(wild strawberry)
Galium boreale	(northern bedstraw)
Cornus canadensis	(bunchberry)
Castilleja miniata	(common red paintbrush)
Vaccinium caespitosum	(dwarf blueberry)

Moss Layer: 10% cover

Hylocomium splendens	(step moss)
Eurhynchium pulchellum	
Peltigera canina	(dog lichen)

SOIL AND SITE

Moisture Regime:	subxeric - submesic
Nutrient Regime:	poor (- medium)
Slope Gradient (%):	0-50
* Slope Position:	upper - mid
Parent Material:	(glacio)fluvial
* Soil Texture:	coarse
Coarse Fragments (%):	0-39
Site Index:	At 22 (20-23)

DISTRIBUTION: rare

AT - KINNIKINNICK (BWBSc1/02-$)

INTERPRETATIONS

Management objectives:	- manage for Pl sawlogs on an 90-year rotation or At fibre on a 80-year rotation. - range or agricultural conversion not recommended due to risk of drought.
Concerns:	- drought
Logging:	- clearcut
Site preparation (softwoods):	
Objectives	- reduce debris; improve planter access
Mechanical	- disc (normal planting), disc-trench or patch scarify (plant depressional microsite)
Prescribed fire	- do not burn
Species choice:	
Preferred	- Pl
Acceptable	- At
Brush hazard:	- low
Silviculture applications:	- site preparation not required if managing for aspen. - may be able to plant Pl stock without site preparation. - attempts should be made to enhance native range, but the effects of burning to achieve this need to be examined.
Silviculture problems:	- extensive periods of drought on these sites may reduce survival and growth of planted stock. - removal of organic layers may increase drought.

BWBSdl 03-$

AT - SOOPOLALLIE

Shepherdia canadensis

Elymus innovatus

Aster conspicuus

VEGETATION

Tree Layer: 50% cover
Trembling aspen

Shrub Layer: 25% cover

Rosa acicularis	(prickly rose)
Viburnum edule	(highbush-cranberry)
Shepherdia canadensis	(soopolallie)
Amelanchier alnifolia	(saskatoon)
trembling aspen	

Herb Layer: 35% cover

Lathyrus ochroleucus	(creamy peavine)
Epilobium angustifolium	(fireweed)
Aster conspicuus	(showy aster)
Malanthemum canadense	(false lily-of-the-valley)
Elymus innovatus	(fuzzy-spiked wildrye)
Pyrola asarifolia	(pink wintergreen)
Gallium boreale	(northern bedstraw)
Cornus canadensis	(bunchberry)
Calamagrostis canadensis	(bluejoint)
Rubus pubescens	(trailing raspberry)
Petasites palmatus	(palmate coltsfoot)
Fragaria virginiana	(wild strawberry)
Vicia americana	(American vetch)
Linnaea borealis	(twinflower)

Moss Layer: 2% cover

Hylocomium splendens	(step moss)
Eurhynchium pulchellum	

SOIL AND SITE

Moisture Regime:	submesic (- mesic)
Nutrient Regime:	poor - medium
Slope Gradient (%):	0-45 (usually less than 15)
* Slope Position:	upper - mid or level
Parent Material:	(glacio)fluvial, morainal, occ. lacustrine
Soil Texture:	coarse - fine
Coarse Fragments (%):	0-30 (usually less than 10)
Site Index:	At 24 (12-31)

DISTRIBUTION: common

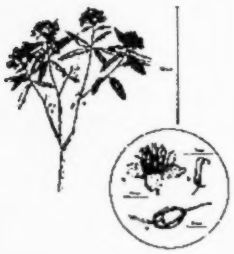
AT - SOOPOLALLIE (BWBSc1/03-$)

INTERPRETATIONS

Management objectives:	- manage for Pl sawlogs on an 80-year rotation or At fibre on a 80-year rotation. - range or agricultural conversion not recommended due to risk of drought.
Concerns:	- drought
Logging:	- clearcut
Site preparation (softwoods):	
Objectives	- reduce debris; improve planter access
Mechanical	- disc-trench or patch scarify
Prescribed fire	- do not burn
Species choice:	
Preferred	- Pl
Acceptable	- At
Brush hazard:	- low - moderate (soopolallie, fuzzy-spiked wildrye, fireweed)
Silviculture applications:	- site preparation not required if managing for aspen. - may be able to plant Pl stock without site preparation. - attempts should be made to enhance native range but the effects of burning to achieve this needs to be examined.
Silviculture problems:	- periods of drought on these sites may reduce survival and growth of planted stock. - removing organic layers may increase drought.

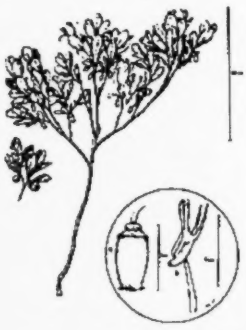
BWBSdl 04-$

AT - LABRADOR TEA



Ledum groenlandicum

Vaccinium myrtilloides



Vaccinium caespitosum

VEGETATION

Tree Layer: 40% cover
Trembling aspen

Shrub Layer: 30% cover

Ledum groenlandicum	(Labrador tea)
Viburnum edule	(highbush-cranberry)
Vaccinium myrtilloides	(velvet-leaved blueberry)
Rosa acicularis	(prickly rose)
Lonicera involucrata	(black twinberry)
Shepherdia canadensis	(soopolallie)
trembling aspen	

Herb Layer: 30% cover

Cornus canadensis	(bunchberry)
Epilobium angustifolium	(fireweed)
Linnaea borealis	(twinflower)
Vaccinium caespitosum	(dwarf blueberry)
Rubus pubescens	(trailing raspberry)
Pyrola asarifolia	(pink wintergreen)
Malanthemum canadense	(false lily-of-the-valley)
Calamagrostis canadensis	(bluejoint)
Vaccinium vitis-idaea	(lingonberry)
Lathyrus ochroleucus	(creamy peavine)
Elymus innovatus	(fuzzy-spiked wildrye)
Petasites palmatus	(palmate coltsfoot)
Fragaria virginiana	(wild strawberry)

Moss Layer: 10% cover

Hylocomium splendens	(step moss)
Pleurozium schreberi	(red-stemmed feathermoss)

SOIL AND SITE

Moisture Regime:	submesic (- subhygric)
Nutrient Regime:	poor (- medium)
Slope Gradient (%):	0-14
* Aspect:	northerly if sloping
* Slope Position:	mid - upper or level
Parent Material:	morainal or fluvial
Soil Texture:	fine - coarse
Coarse Fragments (%):	0-30 (usually less than 10)
Site Index:	At 23 (17-32)

DISTRIBUTION: uncommon

AT - LABRADOR TEA (BWBSc1/04-$)

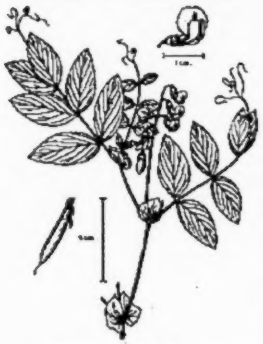
INTERPRETATIONS

Management objectives:	- manage for Pl sawlogs on an 90-year rotation or At fibre on an 80-year rotation. - range or agricultural conversion not recommended due to risk of drought.
Concerns:	- drought
Logging:	- clearcut
Site preparation (softwoods):	
Objectives	- reduce debris; improve planter access
Mechanical	- disc-trench or patch scarify
Prescribed fire	- do not burn
Species choice:	
Preferred	- Pl
Acceptable	- At
Brush hazard:	- low (fireweed)
Silviculture applications:	- site preparation not required if managing for aspen. - may be able to plant Pl stock without site preparation. - large capital expenditures are not warranted on these sites due to poor growth conditions.
Silviculture problems:	- extensive periods of drought and cold soils will reduce survival and growth of planted stock. - removing organic layers may increase drought.

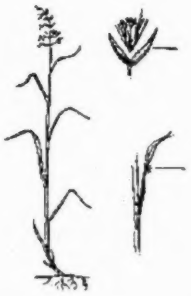
BWBScl 05-$

AT- BLACK TWINBERRY

Lonicera involucrata



Lathyrus ochroleucus



Calamagrostis canadensis

VEGETATION

Tree Layer: 40% cover
Trembling aspen, (balsam poplar)

Shrub Layer: 25% cover

Rosa acicularis	(prickly rose)
Viburnum edule	(highbush-cranberry)
Lonicera involucrata	(black twinberry)
Amelanchier alnifolia	(saskatoon)
Shepherdia canadensis	(soopolallie)
trembling aspen	

Herb Layer: 35% cover

Lathyrus ochroleucus	(creamy peavine)
Epilobium angustifolium	(fireweed)
Cornus canadensis	(bunchberry)
Aster conspicuus	(showy aster)
Rubus pubescens	(trailing raspberry)
Calamagrostis canadensis	(bluejoint)
Mertensia paniculata	(tall bluebells)
Petasites palmatus	(palmate coltsfoot)
Fragaria virginiana	(wild strawberry)
Galium boreale	(northern bedstraw)
Linnaea borealis	(twinflower)
Pyrola asarifolia	(pink wintergreen)
Vicia americana	(American vetch)
Actaea rubra	(baneberry)

Moss Layer: 7% cover

Hylocomium splendens	(step moss)
Eurhynchium pulchellum	

SOIL AND SITE

Moisture Regime:	(mesic -) subhygric
Nutrient Regime:	(medium -) rich
Slope Gradient (%):	3-38 (usually less than 20)
* Slope Position:	mid - toe or level
Parent Material:	(glacio)fluvial, morainal occ. lacustrine
* Soil Texture:	medium - fine
Coarse Fragments (%):	0-50 (usually less than 10)
Site Index:	At 26 (20-44) Ac 27 (22-32)

DISTRIBUTION: common

AT - BLACK TWINBERRY (BWBSc1/05-$)

INTERPRETATIONS

Management objectives:
- manage for At fibre on a 60-year rotation.
- conversion to Sw optional.
- range conversion optional.
- agricultural conversion optional.

Concerns:
- high wildlife value
- windthrow
- possible root rot
- compaction

Logging:
- clearcut

Site preparation (softwoods):

Objectives
- minimize future vegetation competition; improve planter access; prepare planting spots

Mechanical
- disc-trench, disc (bedding) plow, multiple-pass breaking disc or moldboard plow

Prescribed fire
- do not burn

Species choice:

Preferred
- At, Ac

Acceptable
- Sw

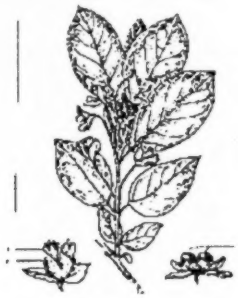
Brush hazard:
- extreme (trembling aspen[4], bluejoint, fireweed)

Silviculture applications:
- site preparation not required if managing for aspen.
- attempts should be made to enhance native range but the effects of burning to achieve this needs to be examined.
- managing for Sw will result in high conversion costs associated with controlling vegetation competition.

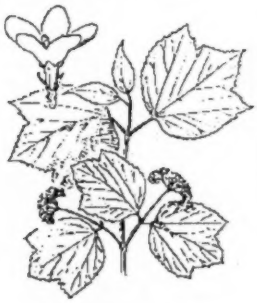
Silviculture problems:
- if conversion to Sw is attempted, extreme competition from aspen and bluejoint grass can be expected; an inspection of these sites at time periods 1 and 4 years after planting will be required.
- these inspections may indicate the need for single or repeated brushing and weeding to retard vegetation competition.
- herbicide use may conflict with wildlife values.

[4]Only a brush problem if softwood conversion is being considered.

AT - OAK FERN



Lonicera involucrata



Viburnum edule

Gymnocarpium dryopteris

VEGETATION

Tree Layer: 25% cover
Trembling aspen

Shrub Layer: 30% cover

Lonicera involucrata	(black twinberry)
Viburnum edule	(highbush-cranberry)
Rosa acicularis	(prickly rose)
Alnus viridis ssp. sinuata	(Sitka alder)
Ribes triste	(red swamp currant)

Herb Layer: 35% cover

Gymnocarpium dryopteris	(oak fern)
Cornus canadensis	(bunchberry)
Epilobium angustifolium	(fireweed)
Linnaea borealis	(twinflower)
Mertensia paniculata	(tall bluebells)
Petasites palmatus	(palmate coltsfoot)
Calamagrostis canadensis	(bluejoint)
Pyrola asarifolia	(pink wintergreen)
Rubus pubescens	(trailing raspberry)
Mitella nuda	(common mitrewort)
Lathyrus ochroleucus	(creamy peavine)
Galium triflorum	(sweet-scented bedstraw)
Arnica cordifolia	(heart-leaved arnica)
Aralia nudicaulis	(wild sarsaparilla)
Equisetum sylvaticum	(wood horsetail)
Smilacina racemosa	(false Solomon's-seal)
Heracleum sphondylium	(cow-parsnip)

Moss Layer: 2% cover

SOIL AND SITE

Moisture Regime:	(mesic -) subhygric
Nutrient Regime:	(medium -) rich
Slope Gradient (%):	0-15
* Aspect:	northerly if sloping
* Slope Position:	mid - lower or level
Parent Material:	morainal or fluvial
Soil Texture:	medium - fine
Coarse Fragments (%):	0-30
Site Index:	At 24 (15-33)

DISTRIBUTION: rare

AT - OAK FERN (BWBSc1/06-$)

INTERPRETATIONS

Management objectives: - manage for Sx sawlog on a 80-year rotation or At fibre on a 60-year rotation.

Concerns:
- high wildlife values
- windthrow
- compaction

Logging: - clearcut

Site preparation (softwoods):

Objectives - minimize future vegetation competition; improve planter access; prepare planting spots

Mechanical - disc-trench, disc (bedding) plow, multiple-pass breaking disc or moldboard plow

Prescribed fire - do not burn

Species choice:

Preferred - At
Acceptable - Sw

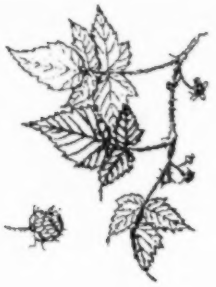
Brush hazard: - high (trembling aspen[5], bluejoint, fireweed)

Silviculture applications:
- site preparation not required if managing for aspen.
- these units are generally small in area and will be included in a cutblock; and so will likely be treated the same as the rest of the block.

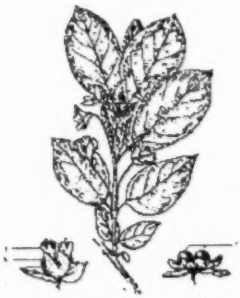
Silviculture problems:
- if conversion to Sw is attempted, high competition from aspen and bluejoint grass can be expected; an inspection of these sites at time periods 1 and 4 years after planting will be required.
- these inspections may indicate the need for single or repeated brushing and weeding to retard vegetation competition.
- herbicide use may conflict with wildlife values.

[5]Only a brush problem if softwood conversion is being considered.

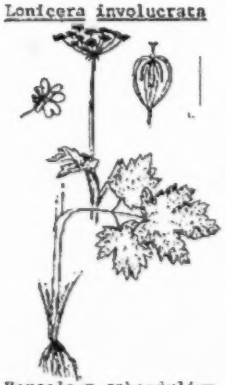
AC - COW PARSNIP



Rubus idaeus



Lonicera involucrata



Heracleum sphondylium

VEGETATION

Tree Layer: 35% cover
Balsam poplar

Shrub Layer: 40% cover

Rosa acicularis	(prickly rose)
Viburnum edule	(highbush-cranberry)
Rubus idaeus	(red raspberry)
Lonicera involucrata	(black twinberry)
Cornus sericea	(red-osier dogwood)
Ribes oxyacanthoides	(northern gooseberry)
Amelanchier alnifolia	(saskatoon)
balsam poplar	

Herb Layer: 40% cover

Rubus pubescens	(trailing raspberry)
Petasites palmatus	(palmate coltsfoot)
Fragaria virginiana	(wild strawberry)
Epilobium angustifolium	(fireweed)
Mertensia paniculata	(tall bluebells)
Calamagrostis canadensis	(bluejoint)
Heracleum sphondylium	(cow-parsnip)
Aster ciliolatus	(fringed aster)
Aster conspicuus	(showy aster)
Lathyrus ochroleucus	(creamy peavine)
Vicia americana	(American vetch)
Equisetum sylvaticum	(wood horsetail)
Cornus canadensis	(bunchberry)
Pyrola asarifolia	(pink wintergreen)
Actaea rubra	(baneberry)

Moss Layer: 2% cover

Mnium spp.	(leafy mosses)

SOIL AND SITE

Moisture Regime:	subhygric (- hygric)
Nutrient Regime:	rich
* Slope Gradient (%):	0-13; usually less than 5
* Slope Position:	mid - toe or level
Parent Material:	fluvial, occ. lacustrine or morainal
Soil Texture:	medium - fine
* Coarse Fragments (%):	0-7 (usually 0)
Site Index:	Ac 25 (21-29) At 21 (18-29)

DISTRIBUTION: uncommon

AC - COW PARSNIP (BWBSc1/07-$)

INTERPRETATIONS

Management objectives:	- manage for Ac fibre on a 40-year rotation. - conversion to Sw optional. - range or agricultural conversion optional.
Concerns:	- very high wildlife value - windthrow - compaction - high water table
Logging:	- clearcut
Site preparation (softwoods):	
Objectives	- minimize future vegetation competition; improve planter access; prepare raised planting spots
Mechanical	- elevate planting site by bedding plows, divider plows, or mounder.
Prescribed fire	- do not burn
Species choice:	
Preferred	- Ac, At
Acceptable	- Sw
Brush hazard:	- very high (balsam poplar[6], bluejoint, fireweed)
Silviculture applications:	- if managing for balsam poplar, no site preparation required. - if attempting conversion to Sw, may need to plant after water table drops below ground level. - windthrow hazard is high if site converted to Sw.
Silviculture problems:	- this association can be critical to the control of runoff and stream flow. - water table may rise above the ground surface in the spring, causing seedling mortality. - herbicide use to control vegetation competition may conflict with the need to protect wildlife values. - if attempting coversion to Sw, very high vegetation competition will require an inspection of harvested sites at time periods 1 and 4 years after planting. - these inspections may indicate the need for single or repeated brushing and weeding to retard vegetation competition.

[6]Only a brush problem if softwood conversion is being considered.

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APPENDIX 1. Meso slope position diagram

a. Crest - the generally convex uppermost portion of a hill (meso scale); it is usually convex in all directions; no distinct aspect.

b. Upper Slope - the generally convex upper portion of the slope of a hill (meso scale) immediately below the crest; it has a convex surface profile with a specific aspect.

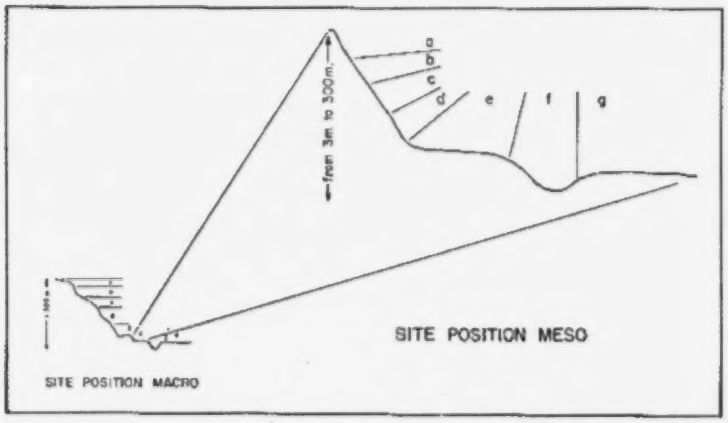
c. Middle Slope - the area of the slope of a hill between the upper slope and the lower slope, where the slope profile is not generally concave or convex; it has a straight or somewhat sigmoid surface profile with a specific aspect.

d. Lower Slope - the area toward the base of the slope of the hill. It generally has a concave surface profile with a specific aspect.

e. Toe - area defined by extent of homogeneous site of slight slope; clearly demarcated by an abrupt decrease in the slope (below and adjacent to the lower slope).

f. Depression - any area that is concave in all directions; generally at the foot of a meso scale hill or in generally level area.

g. Level - any level meso scale area not adjacent to a meso scale hill. The surface profile is generally horizontal with no significant aspect.



APPENDIX 2. Hand texturing field guide

Soil texture refers to the relative proportions of the sand, silt, and clay separates within a soil. These separates have their own distinctive properties of "feel", allowing one to estimate their proportions in a sample of soil by hand texturing. Texture can be estimated very roughly from a dry sample. Clayey materials are very hard, loamy and silty materials are slightly hard to soft, and sandy materials are loose grained. To be more precise, hand texturing should be done using the wet sample procedure given below.

Step 1

Obtain a small handful of soil, crush it in the hand, and remove coarse fragments (particles greater than 2 mm in diameter).

Step 2

Gradually add water to the soil and work it into a moist putty with a soil knife or fingers. The correct moisture content is important. If the putty flows with the force of gravity, then it is too wet. If it crumbles when rolled, then it is too dry. It should have the consistancy of a filler putty.

Step 3

Determine stickiness of the soil putty by working it between the thumb and forefinger, pressing and then separating the fingers. An estimate of clay content can be made in this way. (Clay limits below are approximate).

NONSTICKY: practically no soil material adheres to the thumb and forefinger (less than 10% clay).

SLIGHTLY STICKY: soil material adheres only to one of the fingers and comes off the other rather cleanly. The soil does not stretch appreciably when fingers are separated (less than 25% clay).

STICKY: soil material adheres to both fingers and stretches slightly before breaking when fingers are pulled apart (25-40% clay).

VERY STICKY: soil putty adheres strongly to both fingers and stretches distinctly before breaking (greater than 40% clay).

Step 4

Determine the grittiness of the soil putty by rubbing it between thumb and forefinger. An estimate of sand content can be made in this way. (Sand limits below are approximate.)

NONGRITTY: Little or no grit can be felt (less than 20% sand).

SLIGHTLY GRITTY: Some grit is felt but nongritty material (silt and clay) is dominant (20-50% sand).

GRITTY: Sand is felt as the dominant material. Some nongritty material can be felt between sand grains (50-80% sand).

VERY GRITTY: Sand is the only material that is felt. Little or no nongritty material present (greater than 80% sand).

Step 5

After stickiness and grittiness have been determined, the hand texturing table can be used as an approximate guide to the textural class of the soil. The textural triangle (Figure A2.1) can be used for a more accurate determination of the textural class.

	Nongritty (20% sand)[a]	Slightly gritty (20-50% sand)	Gritty (50-80% sand)	Very gritty (80% sand)
Very Sticky (40% clay)[a]	Silty clay	Clay	Sandy clay	--
Sticky (25-40% clay)	Silty clat Loam	clay loam	Sandy clay Loam	--
Slightly sticky (10-25% clay)	Silt loam or SILT	Loam[b]	Sandy loam	--
Nonsticky (10% clay)	--	--	--	Loamy sand or sand

[a]Sand and clay limits are approximate.
[b]A loam is a textural class exhibiting physical properties intermediate between those of sand, silt, and clay.

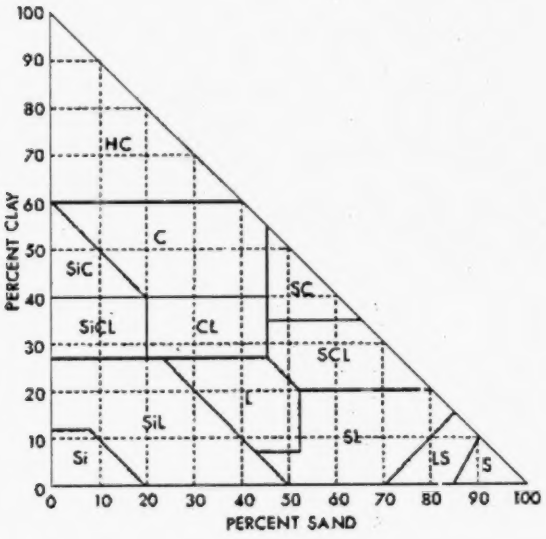


FIGURE A2.1. Soil textural triangle.

APPENDIX 3. Identification of upland humus forms

Mors:	- matted F horizon[a] - common fungal mycelium (white or yellow) - little or no intermixing of organic and mineral materials - abrupt boundary between organic and mineral horizons
Moders:	- loosely arranged F horizon[a] - friable - insect droppings - fungal mycelium and soil organisms (arthropods and occasional earthworms) - intermixing of organic and mineral horizons - gradual transition between mineral and organic horizons
Mulls:	- often no F[a] or H horizons (thin if present) - insect droppings abundant - usually many soil organisms but may form from decomposition of a dense network of roots (Note: usually abundant earthworms.) - considerable intermixing of mineral and organic layers, with incorporation of organic matter into surface mineral soil (Ah horizon)

[a]F horizon: Horizon in which partial (rather than entire), macroscopically recognizable vegetative structures are dominant, i.e., the horizon is partially decomposed.

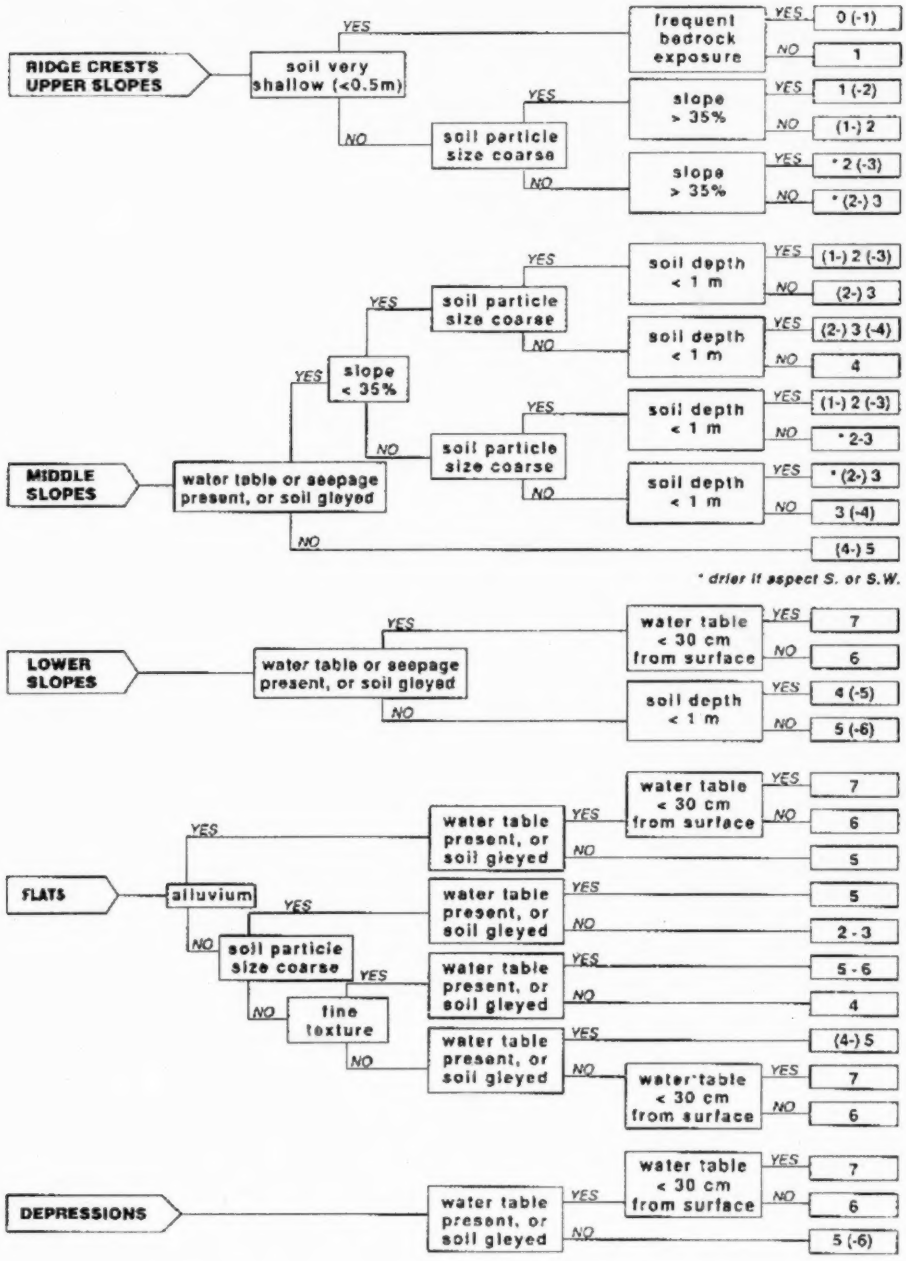
APPENDIX 4. Key to the identification of potential moisture regime (part 1). (from Green et al. 1984)

This key was devised to aid field staff in identifying potential moisture regimes using readily observable environmental features. It should be applied with caution on ridge crests, upper slopes, and middle slopes which have soils with thick (>20 cm) organic layers. Moisture regime in these cases will generally be higher than indicated. The table below provides definitions for the categories used in the key.

Category	Definition
Ridge crest	height of land; usually convex slope shape.
Upper slope	the generally convex shaped, upper portion of a slope.
Middle slope	the portion of a slope between the upper and lower slopes; the slope shape is usually straight.
Lower slope	the area towards the base of a slope; the slope shape is usually concave. It includes toe slopes which are generally level areas located directly below and adjacent to the lower slope.
Flat	any level area (excluding toe slopes); the surface shape is generally horizontal with no significant aspect.
Alluvium	post-glacial, active floodplain deposits along rivers and streams in valley bottoms; usually a series of low benches and channels.
Depression	any area that is concave in all directions; usually at the foot of a slope or in flat topography.
Soil depth	depth from the mineral soil surface to a restricting layer such as bedrock, strongly compacted, or strongly cemented materials (e.g. "hardpan").
Gleyed	soils that have orange coloured mottles indicative of a fluctuating water table. Permanently gleyed soils are dull yellowish, blue, or olive in colour.
Soil particle	sandy[a] with 35% volume of coarse fragments, or size coarse loamy[a] with 70% volume of coarse fragments.
Fine texture	silty[a] or clayey[a] with low coarse fragment volume.

[a]Sandy - LS,S; loamy - SL, L, SCL; clayey - SiCL, CL, SC, SiC, C; silty - SiL, Si.

APPENDIX 4. Key to the identification of potential moisture regime (part 2)[a]



[a] Numbers on the right refer to moisture regime classes as used in an edatopic grid:
0,1 = xeric; 2 = subxeric; 3 = submesic; 4 = mesic; 5 = subhygric;
6 = hygric; 7 = subhydric.

APPENDIX 5. Key to determination of nutrient regime[a]

1a Coarse-textured

2a Very high coarse fragments (>50%) or very shallow (<30 cm) soil.

3a Mor humus form

Very Poor

3b Moder humus form

Poor - Medium

2b Low or zero coarse fragments, deep soil

4a Mor humus form

Poor

4b Moder humus form

Medium

4c Mull humus form

Rich - Very Rich

1b Moderately coarse- and medium-textured

5a Very high coarse fragments (>50%); or very shallow soil (<30 cm); or shallow rooting depth

6a Mor humus form

Poor

6b Moder

Medium

5b Low or zero coarse fragments without restricted rooting depth

---

[a]The presence of base-rich parent materials (limestone, shales, basalt) may improve the nutrient status.

7a Mor humus form

Poor - Medium

7b Moder humus form

Medium - rich

7c Mull humus form

Very rich

1c Moderately fine- and fine-textured

8a Very high coarse fragments (rare); or very shallow soil; or shallow rooting depth (<15 cm)

9a Mor humus form

Poor - Very Poor

9b Moder humus form

Medium - Poor

9c Mull humus form

Rich

8b Low or zero coarse fragments, with good rooting depth (>20 cm)

10a Mor humus form

Medium

10b Moder humus form

Rich

10c Mull humus form

Very Rich

APPENDIX 6. Mensuration data

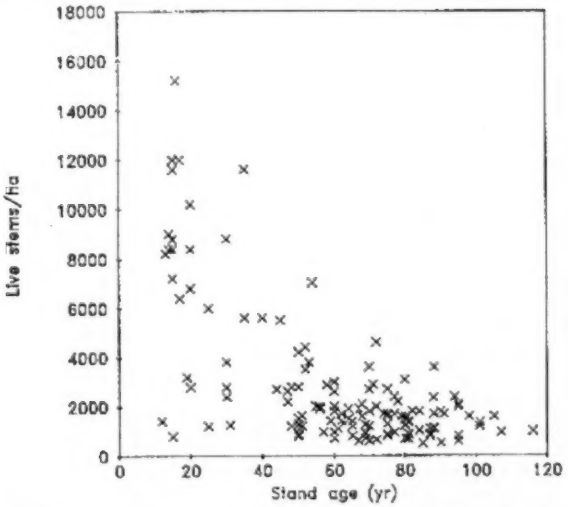


FIGURE A6.1. Scattergram of live stems per hectare vs. stand age for all plots.

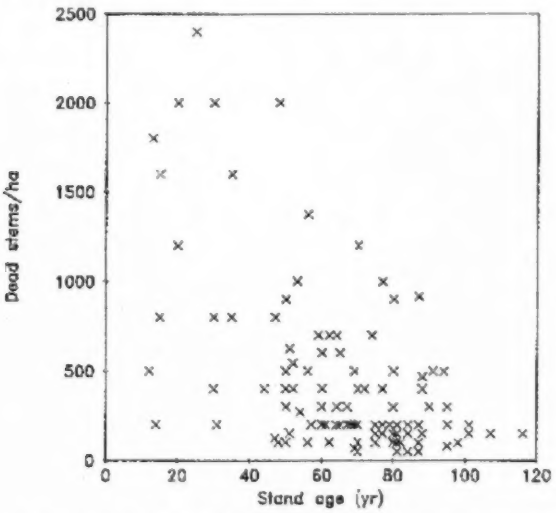


FIGURE A6.2. Scattergram of standing dead stems per hectare vs. stand age for all plots.

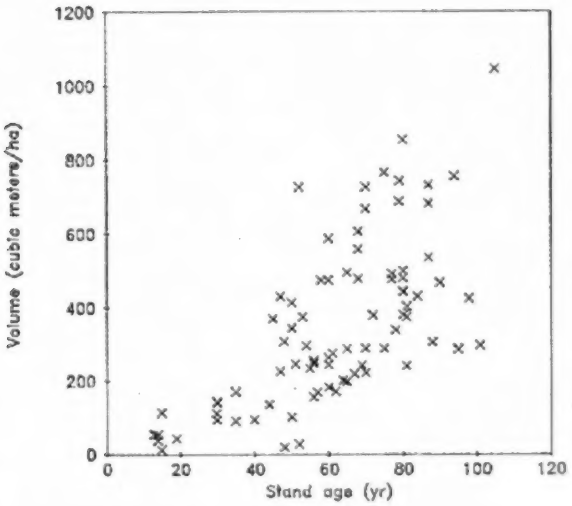


FIGURE A6.3. Scattergram of volume vs. stand age for all plots.

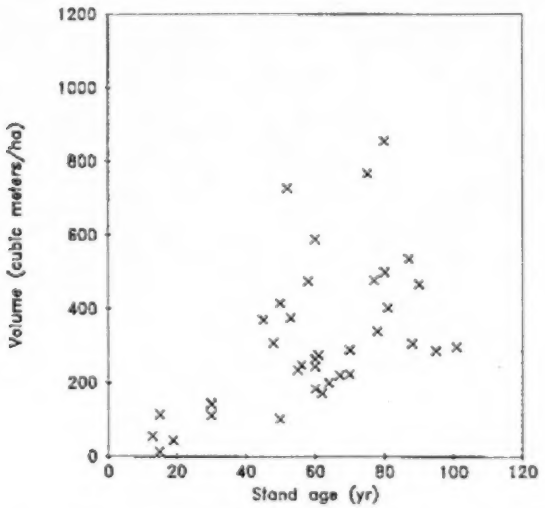


FIGURE A6.4. Scattergram of of volume vs. stand age for mesic plots only.

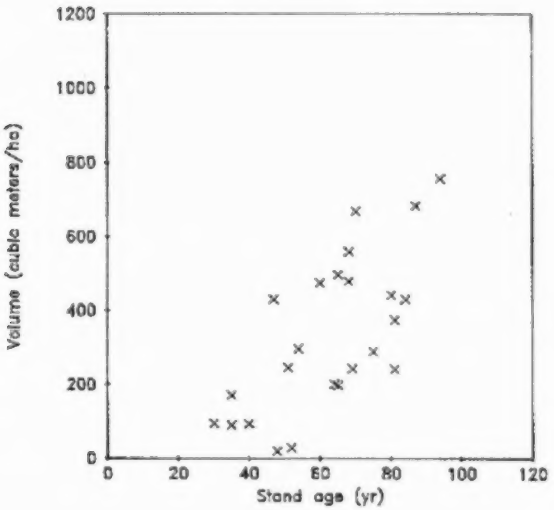


FIGURE A6.5. Scattergram of of volume vs. stand age for submesic plots only.

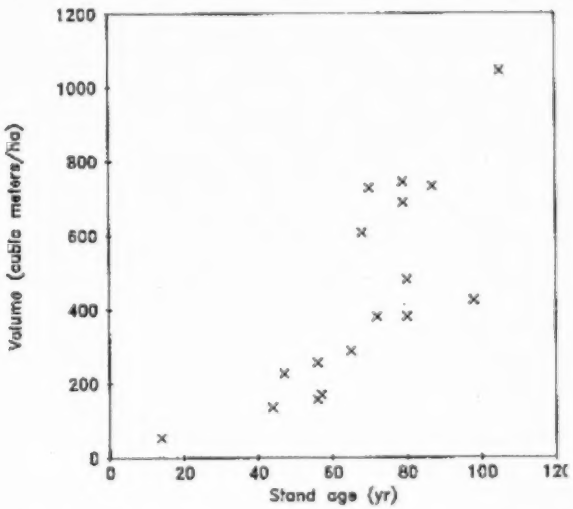


FIGURE A6.6. Scattergram of of volume vs. stand age for subhygric plots only.

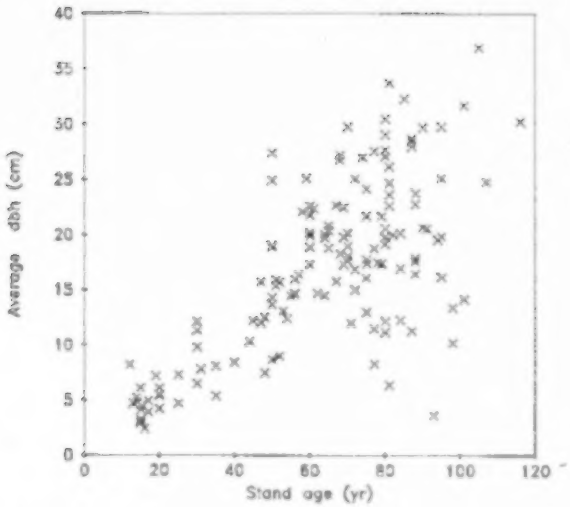


FIGURE A6.7. Scattergram of average dbh vs. stand age for all plots.

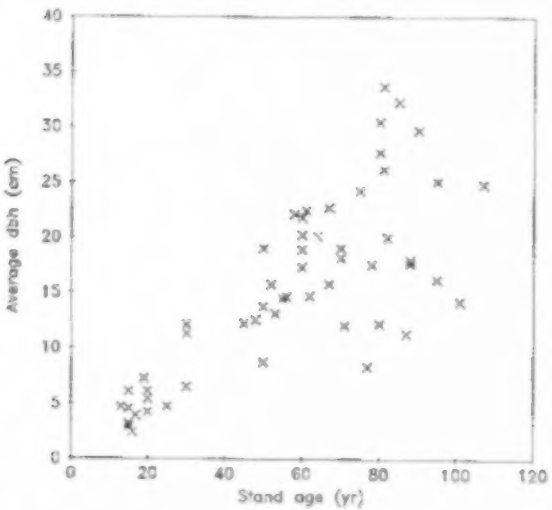


FIGURE A6.8. Scattergram of average dbh vs. stand age for mesic plots only.

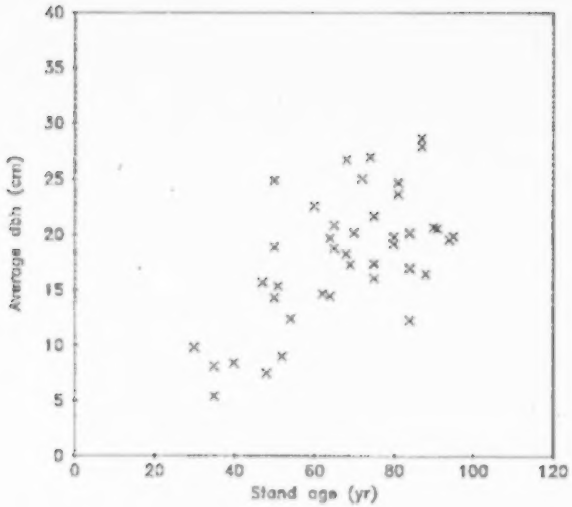


FIGURE A6.9. Scattergram of average dbh vs. stand age for submesic plots only.

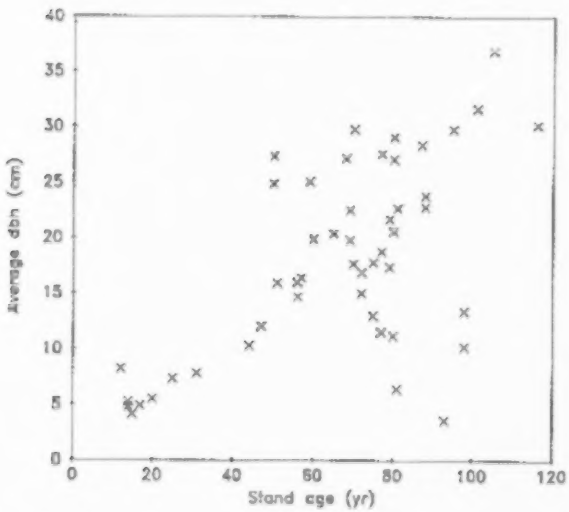


FIGURE A6.10. Scattergram of average dbh vs. stand age for subhygric plots only.